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REVIEW OF *eSPINDLE VOCABULARY & SPELLING PROGRAM ONLINE*

Title	eSpindle Vocabulary & Spelling Program Online
Platform	Windows® 98, ME, 2000, XP, Vista Mac OS® 9.1 or later, Mac OS X
Minimum hardware requirements	800 x 600, 16-bit color display (minimum) 1024 x 768 recommended Sound Card Speakers or headphones
Software requirements	Netscape 5 or higher, Internet Explorer 6 or higher, Firefox (recommended) Flash Player 9 or higher
Publisher	eSpindle Learning Website: http://www.espindle.org/ Phone: 866-377-4635
Support offered	(1) Orientation Slide Show: http://www.espindle.org/introduction.html (2) Live Support: http://www.espindle.org/ (3) Teacher Professional Development (w/site license)
Target language	English
Target audience	High Beginner to Advanced, ages 7 to adult ESL learner
Price	10 Day Individual Trial: Free 30 Day Classroom Trial: Free (up to 40 students) 1 Year Auto-Renewing: US $79.80 1 Year Non-Renewing: US $99.80 Lifetime Membership: US $599 Site license: $24.50-9.50 per student per year
Publication Year	2005

Review by Justin Olmanson, University of Texas at Austin

The ability to successfully make sound-to-symbol connections is seen both as a key enabler of functional literacy (Norton, Kovelman, & Petitto, 2007) and as an integral component in reading acquisition (Nag, 2007). Children developing literacy skills in English, a language that employs an opaque, inconsistent orthography, progress at less than half the rate of children developing literacy skills in languages that use transparent, consistent orthographies, such as Italian or Spanish (Seymour, Aro, & Erskine, 2003).

The eSpindle Spelling and Vocabulary Program (eSpindle) is an online language learning program designed to lessen the drudgery of spelling practice and support the systematic study of vocabulary for first language (L1) and second language (L2) English language learners, ages 7 to adult. An outgrowth of a parent initiative created to help children study for spelling tests (Warda, 2005), the application quizzes its users on individual words stored in a database and arranged by word difficulty and learning goal. eSpindle's uncluttered interface, limited scope, and both internal and hyperlinked scaffolds make it an appropriate choice for L2 English language learners interested in systematically increasing their familiarity with high frequency and orthographically difficult words in a context-reduced environment. Based on the learner's stated goal and self-selected English proficiency level, eSpindle organizes its bank of over 100,000 words to gradually and systematically move the learner toward goals such as spelling bee preparation, English as Second Language word learning, SAT preparation, or homework help.

Ma and Kelly (2006) outline two contemporary approaches to vocabulary acquisition, termed implicit and explicit. The implicit approach, while viable for L1 learners, presents a trinity of obstacles for L2 learners. First, it necessitates high levels of guessing within contexts ranging from supportive to unsupportive. Second, the hit-and-miss nature of contextual guessing constrains the rate of learning (Hulstijn, 1992). Third, the vocabulary that is acquired in this implicit fashion tends to be only receptively available to the learner due in part to a lack of iterative and variegated interaction (Wesche & Paribakht, 2000). The explicit approach, in contrast, reflected in the design of eSpindle, posits that learners can benefit from a decontextualized, often systematic focus on vocabulary acquisition *via* word memorization, definitions, sparse contextual examples, and other strategies. Comprised of a single, modifiable, quiz-like activity designed to focus the learner's attention on word form, use, and meaning, eSpindle fits squarely within the explicit subcategory of CALL applications that address L2 vocabulary learning (Ma & Kelly, 2006).

During the eSpindle registration process, the learner is asked to choose one of the goals listed above and self-select an initial English proficiency/grade level. Upon login, these selections affect the type and difficulty level of the words (Table 1), which appear in the 15 to 500+ item quizzes generated by the application. According to Warda (personal communication, June 29, 2007), in the case of words in the 'English Improvement' section, each word was given a grade level assignment based on the following process: a composite score was compiled by first averaging six textbook publishers' grade level designations; this was then refined *via* a review by eSpindle's editors using heuristics centering on word length and the extent to which a word followed, or failed to follow, conventional phoneme-to-grapheme mappings.

Table 1. Example Words from the eSpindle English Improvement Section by Grade Level.

Grade Level	Words from the English Improvement Section
1st	about, back, bell, came, car
2nd	across, afternoon, ahead, airport, alike
3rd	anger, animal, apron, arch, arithmetic
4th	addition, adjacent, admire, adverb, advertise
5th	abandon, ability, abode, aboriginal, absence
6th	abbreviate, abnormal, absolutely, abundance, abundant
7th	abbey, abject, able-bodied, aborigine, abrasion
8th	abase, abash, abate, abhorrent, abjure
9th	abbess, abdication, abduction, abet, abhorrence
10th	abed, aboveboard, abstemious, accrue, acme
11th	aberration, abrade, abstruse, abut, accession
12th	accolade, adamant, adjuration, allusion, anathematize
college	cession, chine, connive, consortium, contingency
graduate	ambient, antimacassar, aplomb, atelier, biblioklept

Both default and advanced configurations (Figure 1) are available within the quiz format from the preferences page. In the default, spelling-centered mode, the target word is pronounced for the learner by either a text-to-speech generated male voice (e.g., *technology*) or a recorded female voice (e.g., *language*) and is available for repeated listening as the learner works to spell the word within a text entry field. In the advanced, vocabulary-centered setting, a form of active vocabulary recall is required (Laufer, Elder, Hill, & Congdon, 2004); i.e., the learner must produce the word in the text entry field based on a written definition, part of speech, a fill-in-the-blank example sentence, and the number of letters in the target word. The learner may also request the first and last letters of the target word.

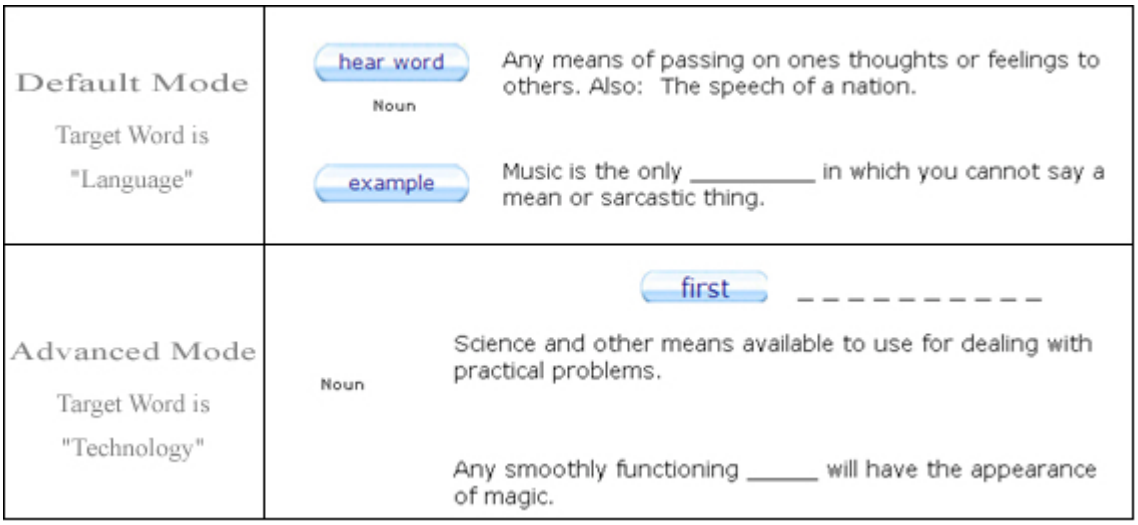


Figure 1. A comparison of the eSpindle default and advanced mode quiz features.

From the start quiz page, the learner sets the target number of correct responses (Figure 2) and clicks the 'Start Quiz' button. This opens a page with an embedded Adobe Flash movie containing the dynamically generated quiz elements. Regardless of the proficiency level and/or learner-selected goal, the quiz interaction and interface remain constant.

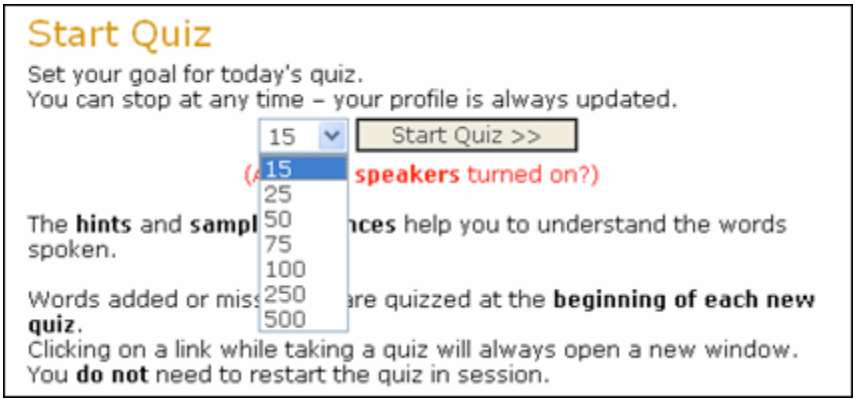


Figure 2. The eSpindle start quiz page.

The quiz interface (Figure 3) is comprised of an oversized text input box, the target word's printed definition, and an example sentence with a blank in place of the word in question. In the default mode, a pair of blue buttons allows the learner repeated opportunities to listen to a pronunciation of the target word (e.g., grim) or to have the written fill-in-the-blank sentence read with the target word inserted (e.g., grim). Sandwiched between these buttons is the word's part-of-speech information, and below them the attribution for the example sentence, as well as a comment button, reside. The learner's progress, in the form of the number of correct answers given, is shown on the right – located between the text input box and the submit button. Finally, the learner may choose to bypass a word via the skip button in the lower right-hand corner. While many users will find the interface straightforward and intuitive, those at the lower bounds of English language proficiency may require some help or experimentation time in figuring out the function of each button, whose text may exceed their proficiency level (e.g., *submit*, *comment*, and *example* are listed as fourth grade words by eSpindle's own ranking system). For these learners, icons or L1 tooltips (supplemental descriptive text in the learner's L1 displayed when a user positions or hovers the cursor over an element of the graphical user interface), instead of English button text, may be more appropriate.

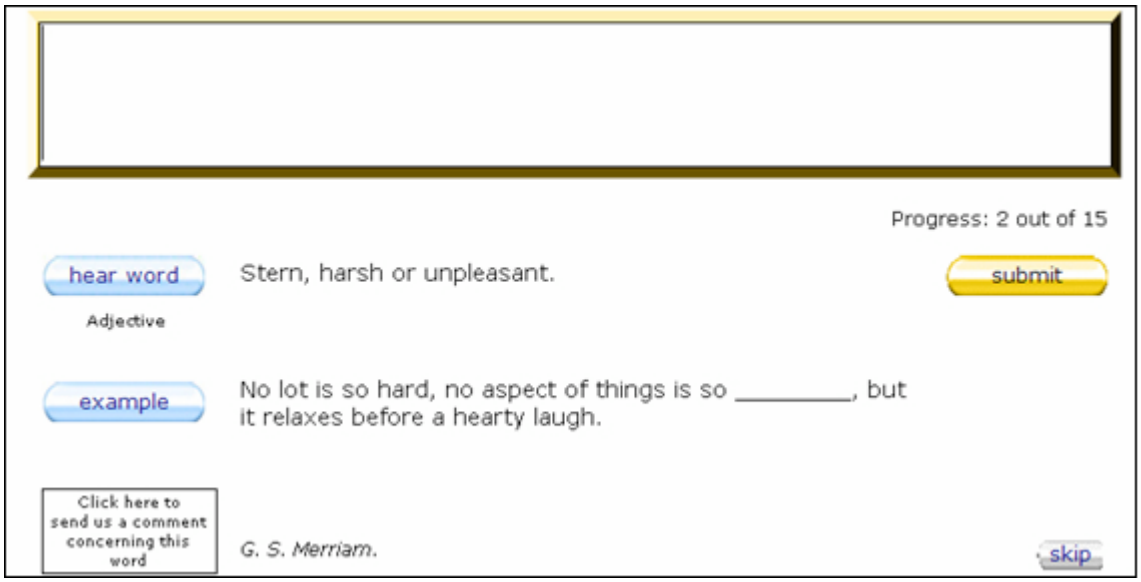


Figure 3. The eSpindle quiz page set to the default spelling-centric mode (target word is 'grim').

Depending on the correctness of the typed learner output, one of two different screens appear. If the learner were to mistakenly type 'glim' (instead of 'grim') and click the submit button the program provides one iteration for the learner to correct the error (Figure 4). The application supports the second attempt by showing correctly spelled portions of the word and blanks in place of the misspelled portions ('g_im'). If the learner wishes to view the word immediately, a 'show answer' button is also available.

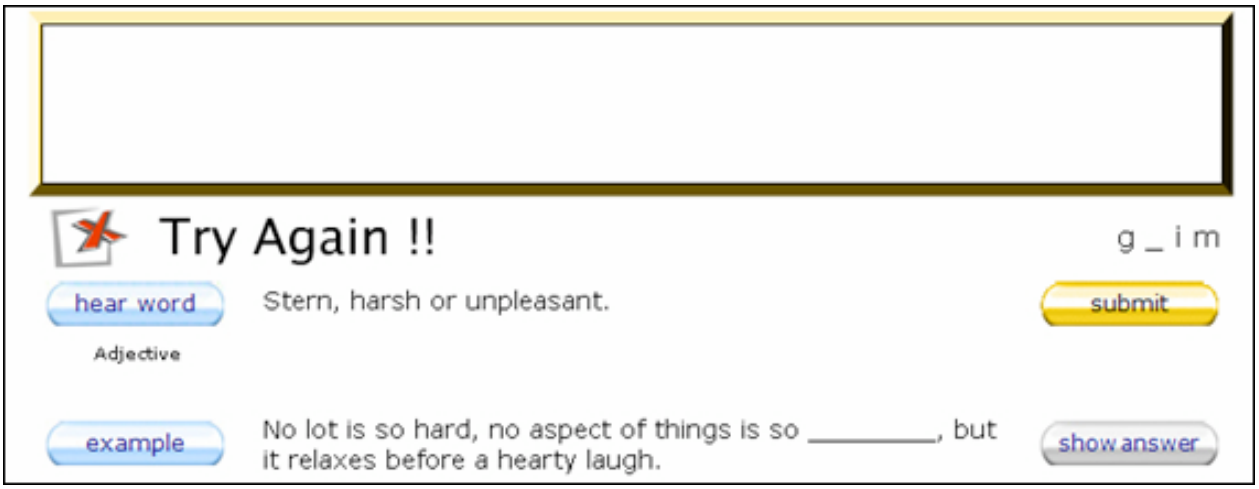


Figure 4. The eSpindle quiz page default mode (target word is *grim*; entered word is *glim*).

Entering the word correctly or incorrectly in the second iteration yields the same basic result (Figure 5). The correct spelling of the word is shown in a special font color, and an option to hear the spelling of the word is given by the 'abc' button within the text input box. The submit button is replaced by a pink 'next' button, and four buttons leading to external hyperlinked resources are offered for further word meaning and usage exploration. Additionally, if the word happens to sound or look like other words, or is easily misspelled, a picture of a woman (whom eSpindle calls Shirley Brainy) appears along with some printed, explicatory text aimed at helping the learner avoid certain word-specific pitfalls. While helpful, the comprehensibility of the proffered Shirley Brainy message suffers due to a suboptimal alignment between the message and the English language proficiency level of the learner. This issue is most notable at the lower proficiency levels. For example, at the first grade level Shirley Brainy's message for the word *you*

is, "another word that sounds like *you* is *ewe* which is a female sheep". Based on eSpindle's own grade level ranking system nearly half the words in the sentence (*another, word, ewe, which, female, sheep*) are one to three grade levels above the first grade level.

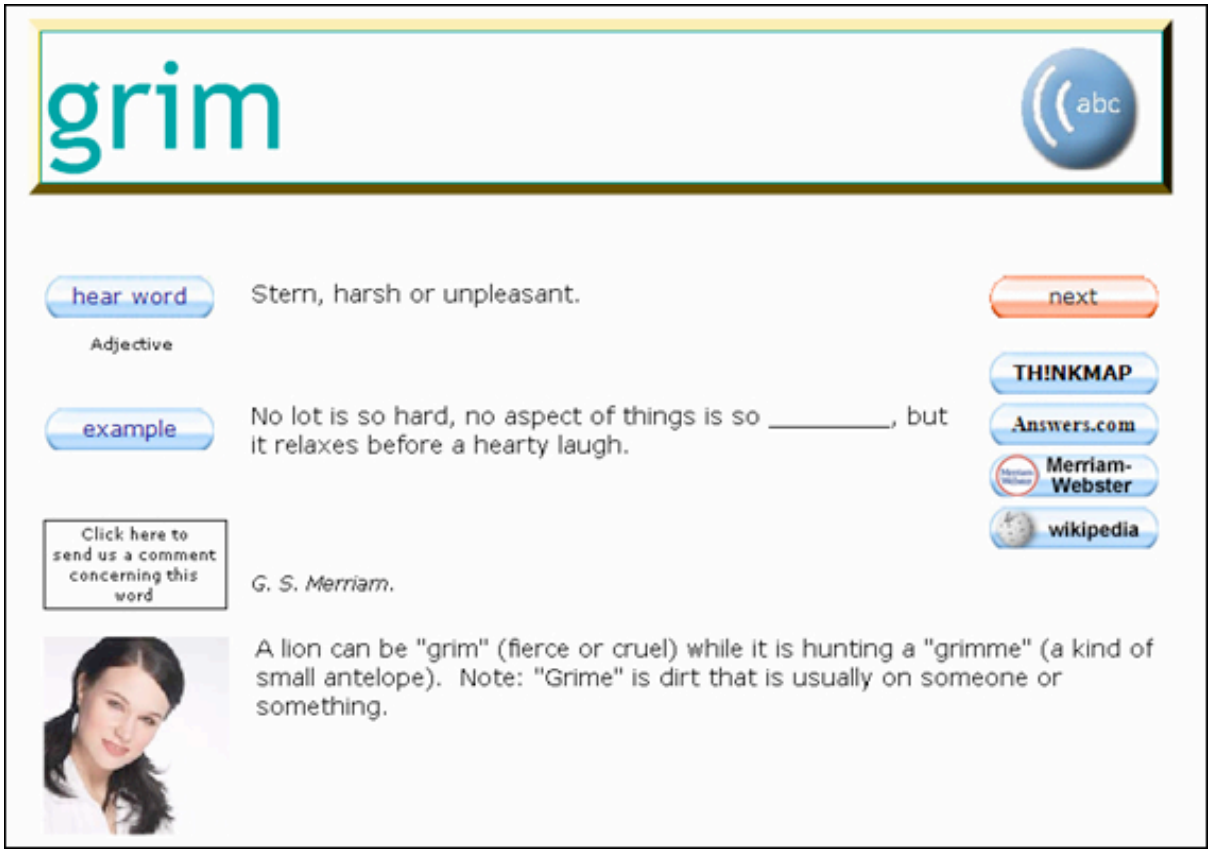


Figure 5. The eSpindle quiz page configured to support word memorization and further exploration.

A click on any of the external hyperlinked exploration buttons opens a new browser window containing additional information about the target word and its meaning. Answers.com offers a meta-collection of information from sources including the American Heritage Dictionary, the Houghton Mifflin Thesaurus, and WordNet. Merriam-Webster affords a pronunciation example, a list of inflected forms, word etymology, and meaning variations. Wikipedia offers encyclopedic information and disambiguation when required. ThinkMap situates the target word within a visual thesaurus (Figure 6) and offers word pronunciation and disambiguation support. While all are accessible free of charge, ThinkMap limits the number of searches or links an unsubscribed user can explore to seven per visit.

Figure 6. The ThinkMap Visual Thesaurus (word passed from eSpindle is *grim*).

Words which are spelled correctly the first time in eSpindle are removed from future quizzes while misspelled words are added to a printable practice list (Figure 7) and are retested in subsequent quizzes until the word has been successfully spelled in three successive quizzes. As all quizzes consist of the same components and follow the same format regardless of proficiency level or learning goal, misspelled words at one level can and do appear again despite an adjustment in the proficiency level or learning goal. Misspelled words beyond the scope of learner interest or academic necessity can be eliminated from future quizzes via a visit to the somewhat cryptically labeled 'practice words' link on the administration page. Similar to the quiz interface and Shirley Brainy text, the website's administration pages and navigational architecture present substantial challenges for learners at the lower bounds of English language proficiency.

Word	Spelled	Misspelled	Number of future correct attempts required to learn word
abattoir	1	6	2
abbess	0	2	3
aberration	1	3	2
abet	1	1	2
abeyance	4	5	1

Figure 7. The eSpindle printer-friendly practice word list.

eSpindle also has a teacher administration component which allows educators to assign goals or upload custom word lists (Figure 8) to all or specific subgroups of students. Progress reports can be viewed by the educator at several grain sizes (Figures 9 and 10). Additionally, teachers can gain access to any student account created under the same site license, meaning student information need only be entered once before all site educators have the ability to add subject or learner-specific words to a student's list (e.g., ESL, science, language arts, math).

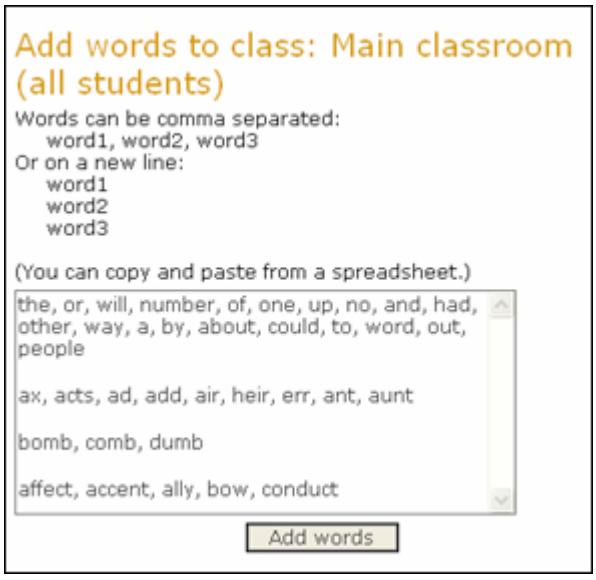


Figure 8. The eSpindle teacher administration 'add words' page.

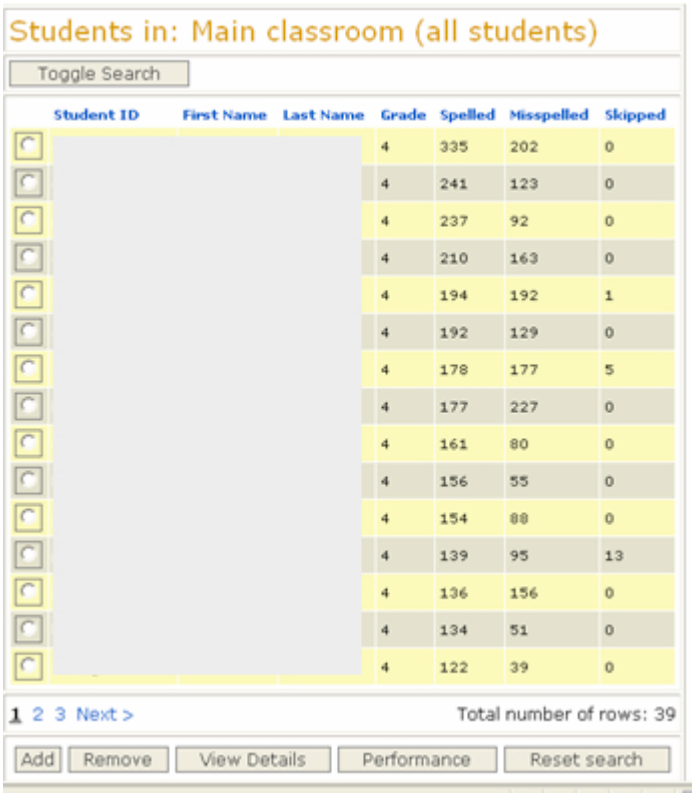
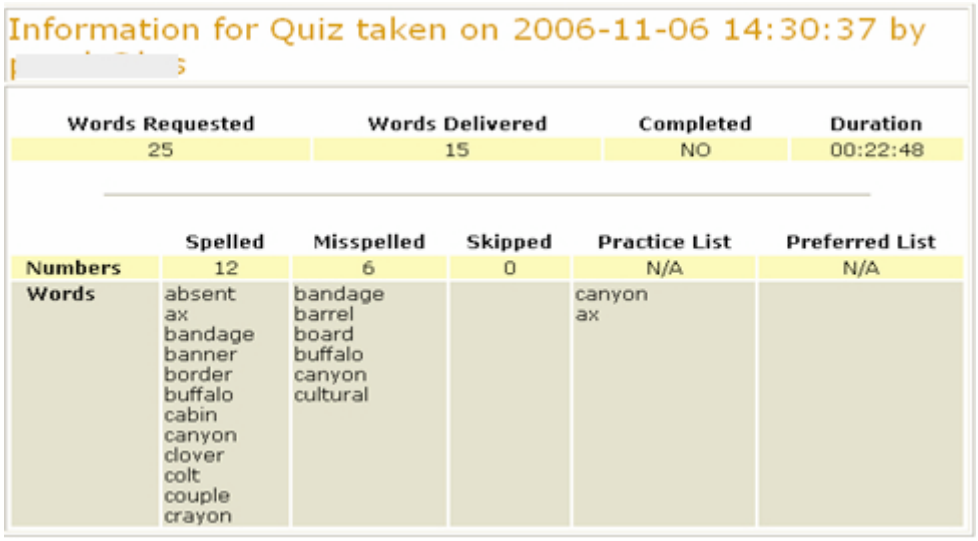


Figure 9. The eSpindle teacher administration classroom progress page.



Information for Quiz taken on 2006-11-06 14:30:37 by [redacted]

Words Requested	Words Delivered	Completed	Duration
25	15	NO	00:22:48

	Spelled	Misspelled	Skipped	Practice List	Preferred List
Numbers	12	6	0	N/A	N/A
Words	absent ax bandage banner border buffalo cabin canyon clover colt couple crayon	bandage barrel board buffalo canyon cultural		canyon ax	

Figure 10. The eSpindle teacher administration student/quiz-specific progress page.

A Parents' Choice Foundation Winner in 2006, eSpindle employs a theoretical framework of lexical (vs. sublexical) neurological storage/recall, explicit instructed vocabulary acquisition, input elaboration, and error noticing, which is evidenced in the application's design and echoed via its organizational literature. In its white paper (Warda, 2005), the non-profit organization explains eSpindle's raison d'être by forefronting:

- the ways accurate spelling and a robust vocabulary enable individuals to more fully participate in professional and academic circles;
- the mismatch between phonics/strategy-based spelling and vocabulary approaches, and the high incidence of irregularly spelled words which may be best acquired via memorization and repetition;
- the difficulty students and parents have in working together to find meaningful, efficient ways to improve spelling and vocabulary that go beyond the norm of weekly spelling test practice.

Whether one favors a single, dual, or parallel neurological model for spelling storage and retrieval (Henry, Beeson, Stark, and Rapcsak, 2007; Norton, et al., 2007), relative agreement exists that for frequently used words, as well as words which fail to follow conventional phoneme-to-grapheme mappings, memorization at the lexical level is an efficacious approach (Cook, 2001; Henry, et al., 2007; Ma & Kelly, 2006; Norton et al., 2007). Thus, a strong case can be made for the appropriateness of eSpindle as a tool for L2 English language learners interested in building spelling and vocabulary knowledge in a context-reduced, word-centric fashion. Furthermore, a subgroup of L2 learners for whom drill-and-practice for spelling and vocabulary acquisition is personally effective and/or culturally resonant may find eSpindle a highly efficacious aid (though as of September, 2007, no study has been conducted with eSpindle to lend empirical evidence in support of or opposition to this assertion).

In as much as eSpindle was designed as a complement to other methods of English language instruction, such as natural language and phonics-based programs (Warda, 2005), Wood's (2001) and Chapelle's (1998) utilization of an interactionist perspective in framing SLA theory for the purposes of software evaluation becomes useful. The application's specialized focus, the interactive nature of its quizzes, its use of multiple types of information and media, as well as its membership in the ranks of CALL, invite an evaluation based on a hybridized amalgam (Table 2) of criteria for multimedia CALL design (Chapelle, 1998, 2003) and vocabulary development (Wood, 2001; Yip & Kwan, 2006).

Table 2. Evaluative criteria adapted from Chapelle (1998, 2003), Wood (2001) and Yip & Kwan (2006) applied to the eSpindle quiz (based on an interactionist model of SLA).

Model Area	Criteria		Internally Present	Externally Linked	Absent
Noticing Salient Forms	Input Highlighting (at the lexical level)	Designer Selected	X		
			Input organized based on proficiency/goal type		
		Instructor Selected	X		
			Via goal selection and custom word uploading		
		Learner Selected	X	X	
			Via goal selection and custom word uploading		
Semantic & Syntactic Comprehension	Input	Simplification			X
			No simplified word-related content available		
		Elaboration	X	X	
			Limited internal via Shirley Brainy, high external		
		Redundancy	X		
			Target word is pronounced, viewed, and typed		
		Adaptation			X
			Word difficulty auto-adjusts up, but not down		
		Background Activation		X	
			Limited: word families and some L1 equivalents		
Negotiation of Meaning	Target Language Output	Production	X		
			Limited: target word is typed in by learner		
		Error Noticing	X		
			Application and learner-led noticing supported		
		Novel Application			X
			No opportunities to use the word in new ways		
	Iterative Correction via Modification	Goal-Based			X
			Production of exact not approximate spellings		
		Error Specific	X		
			Correctly spelled portions of target word given		
		Heuristic Strategies			X
			No higher-order scaffolds or hints proffered		
	Maximal Positive Interaction [learner-computer]	[Task Appropriate] Roles	X	X	
			Limited internal interaction, learner-led external		
		[Interactant] Relationships	X		
			Limited to two iterations of output and support		
		Co-Construction			X
			Application supplies all task-based information		
	Communication Goals	Peer Collaboration			X
			No support given for peer collaboration		
		Learner/Computer	X		
			Limited to target word spelling and/or recall		
		Outcome Options			X
			Three fixed options: success, partial success, and failure		

Note: An 'X' signifies a criterion's presence within eSpindle (Internally Present), presence in one of the hyperlinked resources such as ThinkMap and Answers.com (Externally Linked), or absence (Absent). The merged cell below these designations outlines the extent to which and/or the manner in which a criterion is present or absent.

While checklists for CALL evaluation are no panacea (Chapelle, 1998), for the purposes of this review, Table 2 yields some worthwhile insights into the level and means of support one might expect from eSpindle when used in various instructional settings and for different language learning purposes. As a tool for learning high frequency English vocabulary and irregularly spelled words at the lexical level, it offers support for noticing lexical form, comprehending the given input, and negotiating meaning via interaction.

Future versions of eSpindle may benefit from design changes that meet the needs of additional groups of learners and align with current language teaching methodologies which forefront context, relevance, and learner-centered environments, thereby expanding the audience for which the application is an appropriate tool. Some candidate design changes might include:

- expanded and/or multiple examples of the target word in diverse contexts,
- the inclusion of common idioms and collocations,
- additional opportunities for iterative error correction,
- a quiz mode for each of Laufer et al.'s (2004) four vocabulary understanding designations,
- integrated support for input-highlighting and error-noticing at the sub-lexical level,
- the inclusion of within-quiz hints and strategies based on word properties and etymology, and
- built-in book-specific or topic-specific word lists organized by chapter and/or word frequency.

eSpindle, a 501(c)3 nonprofit organization which has pledged to match every purchased membership (currently at 5,000) with a free license for learners in difficult economic situations (Warda, 2005), recently launched a demo quiz, a vocabulary and spelling themed word list wiki, and scheduled a Word Cup event for those interested in competing with other word lovers around the world (Warda, personal communication, June 30, 2007).

Finally, eSpindle is primarily a tool for practicing spelling words and improving one's grasp of individual word meaning. In terms of its place within the realm of supplemental tools for L2 English development, it exhibits a good learner fit for those interested in a training-orientated, explicit, context-reduced focus on improving spelling and increasing exposure to high-frequency and orthographically inconsistent words. For these learners and others faced with certain institutional constants such as weekly spelling tests and norm-referenced standardized language tests, eSpindle lives up to its name as an online tool which weaves together the threads of word meaning and form to assist in the development of better spellers and aspiring wordsmiths.

ABOUT THE REVIEWER

Justin Olmanson (M. Ed., Harvard University) is a Ph.D. student in Instructional Technology within the Curriculum and Instruction Department at the University of Texas at Austin. His research interests include artificial intelligence in literacy development, Deleuzian design trajectories in CALL, and the influence discourse and personal epistemologies exert on classroom technology use.

E-mail: olmansju@mail.utexas.edu

Website: http://edu.audiotap.com/academic

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